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Small Lot Amnesty tool: evaluating potential population growth benefits and costs in Austin, Texas

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Small Lot Amnesty tool: evaluating potential population growth benefits and costs in Austin, Texas

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Abstract

Small Lot Amnesty tool: evaluating potential population growth benefits and costs in Austin, Texas

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This study examines the Small Lot Amnesty tool, an infill tool option for single-family neighborhoods in Austin, Texas. After the tool's misuse and a heated public discussion, City Council chose to close the developer loophole that many argued did not meet the tool's original intent. The study quantifies potential population growth benefits and costs if the City Council voted the other way, allowing the tool to disaggregate small lots and build multiple homes on what was once only one house. The findings reveal many population growth benefits, such as increased children enrollment into the local school system, but also expose the challenges of such growth, including increased water runoff due to increased impervious cover. Recommendations are made for the City of Austin and City Council to consider, including a public dialogue and outreach participatory program to gather citizen's input, future research opportunities to better understand the tool's potential and issues, and reducing the minimum lot size standards for Single-Family development in Austin.

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CHAPTER 1: INTRODUCTION

Austin, Texas is a city in transition. Located in central Texas, Austin is strengthened by its proximity to three other strong Texas cities, overflows with natural beauty, and hosts a unique and "weird" culture. The city is at a crossroads grappling with immense growth and popularity, while also respecting its history and long-term residents. Weekly, City Council meets with local leaders, businesses, and citizens in an effort to navigate the uphill climb toward Austin's future. City Council must be able to evaluate long-term issues, such as increasing traffic and decreasing affordability, while balancing specialized deliberations such as residential infill. Recent residential infill topics have been approved, denied, or tabled by Council, including recent decisions on accessory dwelling units (ADUs), short term rentals (like Airbnb), and multi-family housing. Another residential infill topic not as well known as ADUs is called the Small Lot Amnesty tool, and it has received much of the Council's, City Staff's, and public's attention and time.

On February 11, 2016, Austin City Council chose to amend its Small Lot Amnesty ordinance to close what many called a developer loophole, through which developers were using the tool in a way that did not meet the original intent of the ordinance. While the city needs more avenues to create density and add more housing stock in their older, centrally located neighborhoods, the City Council chose to limit how lots can legally subdivide, thus limiting the number of detached single- family homes the neighborhoods could have at one given time. Detailed specifics analyzing this tool's history and application will be provided later in this report.

Many continue to question what population growth benefits, if any, the Small Lot Amnesty tool could bring to Austin's older, centrally located neighborhoods. The research question of this report is therefore as follows: what potential population growth benefits can the Small Lot Amnesty tool bring to Austin's older, centrally located neighborhoods? The intent of this research is to quantify the potential benefits of small single-family detached housing in Austin, in order to 1) provide a detailed analysis to the Planning Committee and City Council that was requested, but not provided, during the February 11 public hearings and 2) add to the discussion about housing needs in Austin to serve the general public interest. The intent of the research is not to analyze current zoning regulations, future changes in the land development code, or city consultants' work in detail, but rather to assess the potential benefits and disadvantages in this type of development if it were to be fully allowed or encouraged.

ANTICIPATED FINDINGS

This study will use hypothetical and real world scenarios of Small Lot Amnesty development to quantify likely outcomes compared to status quo development. Common issues or concerns that were raised in the following literature review, City Council discussion, or interviews were evaluated through models found in literature or through Census data analysis.

The report creates two scenarios; the first where a block in the North Loop Neighborhood is redeveloped in typical Single-Family 3 zoning fashion, the second where the same North Loop block is redeveloped following the Small Lot Amnesty tool regulations. Variation in population growth benefits, if any, will then be compared. For example, can the neighborhood block increase the current number of residents? Is it

likely that the neighborhood block will have an increase in the number of children, which could benefit the local school system? Will the neighborhood block increase the public bus system's ridership or increase the local car congestion? Will the added homes increase the neighborhood block's property tax contribution to the City of Austin? Will there be variation in home values, which could potentially improve Austin's housing affordability? Will there be environmental variation between development types, such as water runoff due to impervious cover increases?

This paper is separated into six sections. Following the introduction, the second chapter turns to literature and published reports to characterize and define residential infill. The third chapter discusses recent trends in housing nationwide and in Austin. It also digs deeper into the Austin housing needs by describing Austin's comprehensive plan and neighborhood planning process. Chapter four discusses Austin's various residential infill tools, and focuses on the one this report was written to study, the Small Lot Amnesty Tool. It also recounts the City Council's decision and accounts for the interviews that were conducted for this study. Chapter five summarizes the quantitative analysis of how small lot amnesty could possibly affect, positively and negatively, a certain neighborhood in Austin. Chapter six concludes the report, making suggestions for City staff and suggesting future opportunities for further research.

CHAPTER 2: CHARACTERIZING INFILL

Residential infill development makes use of undeveloped or underdeveloped land in existing developed areas (CoA, 2014; Myers & Gearin, 2001). This can take the form of a dilapidated house on one acre, an abandoned school site, or a vacant lot in a single-family neighborhood. For example, California sought to identify potential infill sites to meet their current and future housing needs, and 71% of the sites identified were refill sites, meaning they were already developed but were economically underutilized (Landis et al., 2006). The remaining were vacant sites. This is useful to note, because public officials or local residents may misunderstand residential infill as only for vacant sites, where as the Landis study identified how much of an impact underutilized sites could have on California's housing needs (2006).

The literature reviewed for this report primarily documents the benefits of residential infill, and includes review of policies or strategies that encourage municipalities and states to make regulatory changes and initiate programs that will encourage developers to increase infill supply. In doing so, the literature also identifies typical constraints for the development of residential infill, and uses various case studies to attempt to dispel some myths surrounding infill projects.

The character of new development will determine the financial impacts for a local government. The development's characteristics will affect the size of impact, dependent on the type (residential versus commercial), location (fringe of city versus downtown), the density, and the infrastructure needed to support the new development. Public infrastructure needs typically include sewer, water, electricity, gas, highways, and transit stops. Residential infill is often contrasted with suburban development, especially on

infrastructure costs and needs. Suburban development requires new infrastructure, while infill is built upon existing infrastructure, which has generally proven to be more economically and environmentally sustainable. Existing infrastructure may vary in age and available capacity, but if building new infrastructure can be avoided, additional costs can be avoided. Infill minimizes taxes needed to support the spreading of development on the city's edge (CoA, 2014a). City spending will increase on any type of development, but lower costs per unit of development should be realized as economies of scale are experienced through use of existing public infrastructure (Lincoln Institute of Land Policy, 2005).

Residential infill preserves land. At a higher density than suburban development, infill protects undeveloped land and preserves the natural environment. Land subject to sprawling development can be spared from development if growth is focused in developed areas. Suburban households in lower densities typically have a larger carbon footprint compared to higher densities; the houses consume more energy and also incur more travel (Glaeser, 2011). As America's population growth is focused in metropolitan areas, land is becoming increasingly scarce. Some states, such as Oregon, have Urban Growth Boundaries and a Growth Management Act to protect undeveloped environments from sprawling development, but states such as Texas do not have such authority. If an area hopes to preserve undeveloped land, the literature suggests cities encourage mid-level density, between 10 to 20 units per acre, to help the market respond to growth and environmental management goals simultaneously (The Housing Partnership, 2003).

Residential infill can also revitalize neighborhoods. Not only do more residents in a given area pay more property taxes, but they also spend money. This spurs retail, office

developments, restaurant openings, cultural activities, religious activities, and the use of parks and recreation space (ULI, 2001; CoA, 2014). As housing preferences begin to shift back to city centers, planning for infill can improve sales taxes and job opportunities for the neighborhood.

Lastly, residential infill can encourage the use of transit services and alternative transportation, like walking and biking (ULI, 2001). Coordinating infill near existing transit routes or future improvements can increase ridership from those who may forego their single-occupancy vehicles for small distance trips and work commutes. Many cities have long-term transportation goals to increase their ridership, and residential infill can be an opportunity to place more residents near existing transit services. Many of the case studies analyzed sought to identify infill sites within 1/3 mile of existing rail or bus transit stations (Landis et al., 2006). By placing residential infill near transit, future residents may decrease their overall driving patterns, thus decreasing any traffic concerns of residents (Zhang, 2009).

However, it is important to recognize not all residents that move into a transit rich neighborhood will forego their vehicles and use transit more frequently. Pollack et al. (2010) found households with higher incomes and who are white are less likely to use transit than low-income households who are also black or Hispanic. This study also found new homeowners or condominium households were less likely to take transit than the renters that had lived in the area previously (Pollack et al., 2010). Three demographic groups are more likely to use transit and live near transit than other Americans, people of color, low-income households, and renters. A change in the neighborhood's demographics may result in less ridership than the city previously planned for.

Although there are many potential benefits of residential infill to the general public, there are also many constraints hindering the development of needed typologies to encourage infill housing. Many sites may not be zoned as residential or at the needed density under local Land Use maps or zoning ordinances, meaning exceptions would need to be made on a case-by-case basis (Landis et al., 2006). Often times, local comprehensive plans prioritize dense and efficient development like residential infill, but land use maps are not updated to reflect these new priorities.

In a Smart Growth survey targeting northern Wisconsin municipalities, there was a direct correlation between whether or not the government permitted smart growth development and whether or not there were zoning ordinances in place that reflected smart growth principles (Gocmen & LaGro, 2015). Therefore this survey found having the ordinances in place drastically increased the smart growth involvement of developers. One of many Smart Growth goals is to reduce a residential development's environmental impact, and many from the survey noted smaller footprints, smaller lots and housing types other than single-family detached can improve environmental impacts (Gocmen & LaGro, 2015). Without the ordinances in place, the market would have less likely responded to Smart Growth comprehensive plans, possibly because the development would require variances.

This common problem leads to administrative delays and neighborhood backlash when infill development is proposed (Idaho Smart Growth, 2005). The approval process for developing infill can take many forms, such as conditional use permits, subdivision plats, or rezoning. Sometimes waivers are sought for reducing lot size requirements or set back standards (Idaho Smart Growth, 2005). Making exceptions or granting variances

can be timely and costly for local authorities and developers, so if such regulatory changes can be incorporated into updates to land use maps, land development codes, zoning ordinances, or existing public participation events, the process would then be addressed efficiently. The Smart Growth Wisconsin reported that many municipalities had to overcome barriers even after zoning ordinances were in place. Such barriers include economic constraints, lack of public support, permitting approval time, and higher upfront costs (Gocmen & LaGro, 2015).

Another example of costly constraints is off-site requirements for developers, such as road improvements, school fees, or park fees. Additional fees for infill projects can make the development financially infeasible, however without these fees, neighborhoods will often not support the project (Landis et al., 2006). If the local authority prioritizes infill, they can be proactive and mitigate the costs of such improvements or support financing options prior to developer involvement.

A major constraint typically faced by developers and cities is neighborhood resistance and backlash. Neighborhood opposition to change has been coined as NIMBYism, or Not In My Backyard. Many residents in established neighborhoods use the argument of preservation[1], which has enacted enormous powers to restrict growth and change, even if the change can help the region become more productive or innovative (Glaeser, 2011). Literature calls for localities to develop a comprehensive community outreach and education strategy to generate public support (Landis et al., 2006; Idaho Smart Growth, 2005). Idaho Smart Growth's (2005) study set out to examine fears voiced by the neighborhoods in Treasure Valley, Idaho regarding residential infill development.

[1] There are in fact examples of preservation ordinances that permit secondary units not visible from the street.

Responding to common concerns such as increased property taxes, increased traffic congestion, increased street parking, and loss of green space, the report examined property valuation, traffic conditions, parking counts, and neighborhood perceptions three years before and after residential infill developments were allowed. In conclusion, Idaho Smart Growth (2005) found residential infill caused no harmful impacts that were previously defined by residents.

The following is a summary of Idaho Smart Growth's results. Many properties that were later used for residential infill had previously been vacant; therefore many neighbors felt the loss of private and public open space, even though these spaces were not created for recreational use. So although the loss of green space was valid, it was private property. Many neighborhoods that received residential infill experienced changes in property values that were comparable to regional increases, but sometime more, sometimes less than the regional average. The research could not conclude whether or not the infill was the reason for the increases and decreases in property values. This issue was hard to analyze because other variables could affect the property values, such as changes in nearby amenities like shopping or business centers. Many of the infill single-family home sites did in fact sell for a lower sell price, but at a higher cost per square foot. But for the most part, the neighborhood's concerns regarding impacts on surrounding property values were not valid.

There were no harmful impacts on traffic in the existing neighborhoods that received residential infill. Most neighborhoods had consistent or less traffic numbers, yet there were a few cases where traffic counts did increase. Those instances of traffic increases can be attributed to lack of roadway connectivity. The last conclusion

Blanchard found was that design quality standards could positively affect neighborhood acceptance of potential infill developments.

The Boulders infill development in Seattle, Washington also experienced neighborhood backlash. The 2006 project was surrounded by single-family homes in an older Seattle neighborhood, in close proximity to downtown Seattle. The zero-lot line infill site planned to have nine single-family detached houses, each with four stories, and roughly 1,800 square feet. Neighbors apposed the project because of its height and effected view corridors. The developers chose to set up meetings with the neighbors, although it was not required. After engaging the community, the developer applied for design review and permit process (ULI, 2006). This is an example of a site, previously very-low density, which was up zoned for increased density. In the end, the neighbors were accepting of the project because of the noise barrier it created from the nearby freeway, and the public water features the developer installed.

The Elm Brook Homes in Concord, Massachusetts was not an urban infill project, but was rather a suburban, cluster infill site. The 2002 project set a standard for high quality workforce housing and neighborhood engagement. The developers partnered with a land trust and created a one-year task force whom decided the design and conditions of the site. The neighbors feared their property values would decrease due to the increased likelihood of flooding. After a zoning change, permit approval, and task force engagement, the project successfully housed twelve working families in single-family, detached homes (ULI, 2005). The flooding issue was a primary factor in the design of the site, and was taken very seriously by the developers.

CHAPTER 3: TRENDS IN HOUSING DEMAND AND SUPPLY

NATIONAL TRENDS

Before the 2008 housing crisis, there was a national trend of population shifting back to the center city. Housing preferences were shifting toward city center development for many reasons, including mounting traffic congestion, decreased crime rates, and the growth of café culture (Myers & Gearin, 2001). Sixteen out of the twenty largest cities have gained population between 1990 and 2000, although not all to the levels of population they each lost in the 1970s (ULI, 2001). As this shift continues post-2008 recovery, many question if this shift to urban centers will remain. While mid-size cities are also experiencing this urban living growth, it is important to note a few metropolitan suburban areas in fact grew at a higher rate than the central city (ULI, 2001). And even though the growth is sizable, city and metropolitan officials do recognize that many households are excluded from this movement because they cannot afford the urban cost of housing, or simply prefer to live in the suburban or rural counterparts. Therefore, many households are either forced to the periphery where they are willing to trade off long commutes for housing savings, or are locating in suburban town center models to replicate the benefits of city center residential areas (ULI, 2010; Glaeser, 2011).

Such is the dilemma: those seeking to move into urban living environments have a slim selection of older housing in older, centrally located neighborhoods at a premium price tag. If capable of paying this price, the households are willing to pay for the added benefits of what Myers titles “Traditional Neighborhood Development” (TND) (2001, pg. 633). These older areas, or Traditional Neighborhood Developments are meeting the growing demand for small town features like shops and narrow streets, preferences for

housing styles other than single-family detached houses, higher density development, and less automobile dominated development (Nelson, 2013). TNDs typically have a diversity of housing types for different ages, incomes, and lifestyles, so are said to support a more diverse population rather than the homogenous population found in homogenous housing typologies (CoA, 2014a).

Since many city centers are largely built out, the existing TND housing stock is outpaced by the demand. For reasons that were explained in Chapter 2, developers and homebuilders are not able to meet the demand of developing TND infill near the city center or redeveloping existing stock into TNDs, especially due to NIMBYism (Glaeser, 2011). Since the majority of movers and homebuyers move into existing housing stock, the new construction market caters to a very small percentage of movers. The annual American Housing Survey finds that only 2% of homebuyers move into new construction every year (Myers & Gearin, 2001). And because of availability of land and capital, the construction market is more likely to build suburban style development for those who prefer such development style and for those who cannot afford the premium prices of TND.

Therefore, the market is failing to meet certain households' needs. Data from the 2009 American Housing Survey indicates that attached housing comprises of 30% of the existing housing stock, small lots (under a sixth of an acre) are about 20% of the supply, and conventional lots (large, suburban) are about 50%. This is a mismatch, especially since only a forth of those surveyed desire to live on a conventional lot. Although it is not every household's desire to live in an urban environment, those that have the desire

should be given a level playing field. Historically, sprawl and suburban growth has been given the upper hand through federal subsidies, programs, and services (Glaeser, 2011).

Since WWII, Americans have gravitated, or sometimes been guided, toward low-density, detached single-family homes with easy automobile use and suburban design (Myers & Gearin, 2001; Glaeser, 2011). Many were attracted to the larger homes and the independence of the automobile. Federal home mortgages interest deduction, transportation funding, and other incentives and policies also made suburban living more attractive than urban living. These aside, Myers' study supports recent changes in the conventional wisdom towards walkable, pedestrian-oriented development (2001). Other vocabulary Myers chose to describe changing housing preferences was traditional neighborhood development, neotraditional, New Urbanism, and transit oriented development.

Literature has found life cycle and family status are a large determinate in housing preferences (Myers & Gearin, 2001; ULI, 2010; Glaeser, 2011). Those of 45 years or older are shifting away from detached single- family homes, toward denser, smaller lot communities within walking distance to shops and employment centers (Myers and Gearing, 2001; Nelson, 2013). Some seniors will want to age in place and remain near the networks and friends they have created over time (Nelson, 2013). Families with children are decreasing as a share of population, meaning fewer families will seek larger homes in suburban style development. (Although school quality remains a large determinate of families moving towards the suburbs (Glaeser, 2011.)) The size of households has been decreasing generally as well, and the fastest growing household type is made up of married couples without children (ULI, 2010). Therefore, the future housing market will

be driven by the following demographic groups: older baby boomers, younger baby boomers who cannot sell their suburban houses, Generation Y who will rent longer than other generations to date, and immigrants and their children who will find that they cannot afford the existing housing prices (ULI, 2010; Nelson, 2013).

AUSTIN TRENDS

Austin is experiencing similar demand for housing near the city center. While many would prefer to live in Traditional Neighborhood Developments, households cannot afford the housing costs in many parts of the city, not only the city center. Growing 20% from 2000-2014, Austin became the 11th most populous city in the US. While population projections forecast Austin's population will double in the next 30 years, forecasted eminent housing supply issues are an easy sell, because Austin has been living in a housing crisis for almost a decade. The number of housing units only increased by 80,000, whereas the Austin population grew by nearly 600,000 between 2000 and 2012 (Real Estate Council of Austin, 2015). Although there must not be a one-to-one ratio of units built to population increase, housing construction at all densities dragged behind demand. One contributing factor to this delay may be regulation. Glaeser (2011) describes how New York City's zoning rules, heights restrictions, and regulation boards create a difficult environment to build homes. And although the housing preferences for TND have increased, more and more of Austin's residents are being out priced of the housing market. A construction friendly environment typically results in lower housing prices. Glaeser (2011) compares Chicago to New York and Boston, where allowing construction has maintained affordable housing costs in Chicago over time. Austin's share of population compared to suburban population has been declining since the 1960s

(CoA, 2012). Yet Austin remains the economic center of the metropolitan area; 56.3% of the city's workers are commuting into work from surrounding cities (U.S. Census, 2016).

Although it is not surprising that average housing and renting costs would increase with a growing region, it is how fast the prices rose in such a short time. The Real Estate Council of Austin found that between 2000-2012, median home values grew 78%, average rents increased by 50%, and average property taxes increased 40%, while median incomes only rose by 9% (2015). This is not because land is scarce; it is because Austin's land is not being developed efficiently. Therefore, all housing tenures have been affected from the region's population growth. Such growth sparked two planning efforts: updating Austin's comprehensive plan, and initiating neighborhood plans.

Imagine Austin Comprehensive Plan

In June 2012, the *Imagine Austin Comprehensive Plan* (IACP) replaced the 33-year old *Austin Tomorrow Comprehensive Plan*. As a true comprehensive plan, IACP set out to forecast Austin's growth patterns with sensitive goals and priorities in transportation, land use, historic preservation, cultural amenities, and much more. Two out of the six core principle actions defined were to "Grow as a compact, connected city" and "Develop as an affordable and healthy community" (CoA, 2012, pg. 10 - 11).

Although these goals clearly hint at the need for change, the plan also balances the challenges in a growing population by maintaining and protecting the local neighborhoods. Language such as "maintaining the unique and distinct character of Austin neighborhoods, while meeting the market demand for close-in housing" shows evidence of the impact of Austin's recent growth (CoA, 2012, pg. 135). Therefore, in an

effort to direct Austin's growth into a compact and connected city, the plan calls for context sensitive infill, protecting neighborhoods, and assessing infrastructure needs.

The plan recognizes many benefits of compact neighborhoods, and lists the issues and costs of Austin's current low-density development. Throughout the plan, 'higher-density', 'closer- in affordable housing', and 'infill development' are quoted numerous times. One IACP priority action goes as far to "promote diverse infill housing such as smaller-lot single-family houses and row houses" (CoA, 2012, pg. 228). The intent of this priority action is to redirect the population growth away from the low-density development patterns. The plan identifies that this type of development will support all of the plan's goals, from protecting Austin's open spaces to improving the transportation viability of Austin's future. Residential infill and redevelopment has in fact occurred in Austin's older, centrally located neighborhoods with the recent urbanization trends, but not at a comparable rate to the lower-density suburban growth in the periphery of Austin (CoA, 2012).

As noted in the literature, no comprehensive plan is implementable without a representative change in the city's budgets, transportation plans, and land development code (Landis et al., 2006). In an attempt to transition the new Austin comprehensive plan into a living, breathing plan, Austin has recently taken on the challenge to update its complex land development code (LDC). The City of Austin's process to rewrite the code is called CodeNEXT, and will be completed in 2017.

Opticos Design, the consultant hired to rewrite Austin's LDC, released in May 2013 the 'Land Development Code Diagnosis'. This report summarizes the main issues with the existing LDC that could specifically hinder development in line with IACP.

Directly relating to residential infill, the diagnosis analyzes current single-family regulation and Neighborhood Plans, and found the following issue. Austin's zoning type Single-Family 3 (SF-3) is broadly applied over 11% of the city (when the Residential Land Use was only 22% of the city in 2010), and is also applied over pre- and post-1940s neighborhoods. SF-3 is important here, because SF-2 has more restrictions and do not allow many of the City of Austin's infill tools. However, the zoning type does not contextualize the wide variety of neighborhoods, including differences in lot sizes, building sizes, and multi-unit types. Therefore, the zoning designation encourages suburban style housing development that is not appropriate in older neighborhoods (Opticos, 2014). The broad application of SF-3 can lead to problems when "infill development or redevelopment occurs within a neighborhood" (Opticos, 2014, pg. 42). Thus, housing character is questioned, density regulations are critiqued, and the city review process is lengthy and inconsistent.

Austin has continued to produce low-density development that is not efficiently solving the need for more housing units. IACP claims growing in this fashion would be unsustainable for Austin's infrastructure and environment. The Real Estate Council of Austin called for at least 100,000 units within the city limit by 2025 to accommodate population growth (2015). Whether or not Austin can meet such a goal depends on city zoning, development ordinances, and regulations. Current regulations are preventing such infill opportunities, like TND, that would meet changing housing preferences and the need for housing units. As Austin revises its LDC, such issues are hopefully addressed to encourage Austin's compact, connected, and affordability goals.

Neighborhood Plans

Prior to IACP, City staff worked with neighborhoods to create Neighborhood Plans. This planning opportunity focused on local issues and concerns, addressing land use, zoning, transportation, and urban design issues through a shared neighborhood vision (CoA, 2012). Between 1997 and present day, neighborhoods and city staff worked together to create future land use maps through public participation events. Figure 1 displays the current status of the City of Austin's Neighborhood Plans and their respective locations.

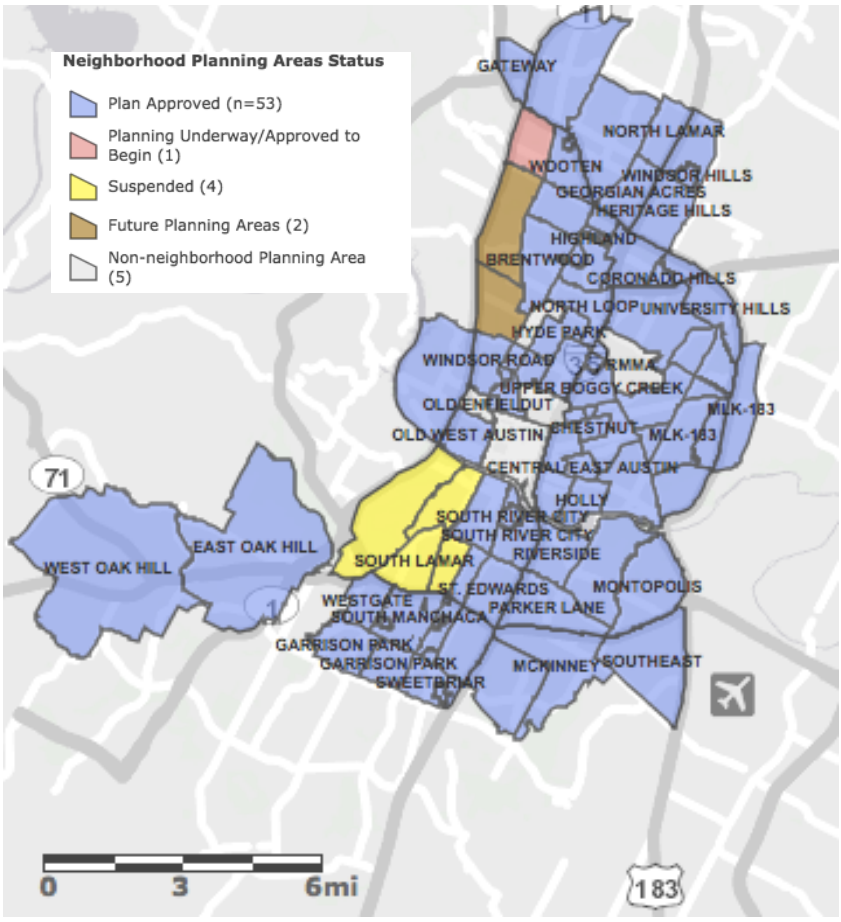

Figure 1: Neighborhood Planning Area Status. (CoA, 2014b).

A great deal of time and effort were put into the Neighborhood Plans, where consensus was reached on how the neighborhood wanted to develop in the future. In an effort to encourage greater diversity in housing and mixed-use options, City Council passed the Neighborhood Plan Combining Districts in April 2000. This created Infill Special Uses within the Neighborhood Plans to opt in or opt out on certain type of development categories that would allow new, small lot single-family construction (CoA, 2014a). The city's Special Use Infill Options acknowledged that Austin's traditional neighborhoods provide benefits such as accessibility to services and amenities by means other than the auto and a diversity of housing for different ages, incomes and lifestyles (CoA, 2014a). These infill options, or also recently coined as the "Missing Middle" housing typologies, could achieve medium-density housing, producing typologies between single- family homes and mid-rise flats. They've been classified recently in Austin as the "Missing Middle" because very few of these housing typologies have been built since the early 1940s due to regulatory constraints, concerns about teardowns, and neighborhood density impacts (CoA, 2015a). Table 1 below summarizes the various infill options neighborhoods could consider, but not many neighborhoods chose to opt into the tool. Although many recognize the opt-in/ opt-out system was an opportunity to increase building type diversity, increase density, and improve the feasibility of non-conforming uses, the opt in/ opt out system also added complexity to the already complex development process.

	Number of Neighborhoods opt in	Minimum lot area and width	Stipulation
Small Lot Amnesty	36	2,500 sq. ft./ 25 ft.	On existing, legally –created lots/ Subdivision not required
Cottage Lot	11	2,500 sq. ft.+*/ 30 ft.	Subdivision required
Urban Home	13	3,500 sq. ft./ 35 ft.	Subdivision required
Secondary Apartment	19	850 sq. ft.; on a lot size of 5,750 sq. ft.	Impervious cover may not exceed 45% (the other options >65%).

Out of 50 neighborhoods, based on 2012
*3,500 if lot is adjacent to a SF-3 use, which is the most common residential zoning district.

Table 1: Special Use Infill Tools (CoA, 2014a).

As the table shows, not many neighborhoods opted into the special use options, with a few neighborhoods choosing to opt out of all types. The least common tools chosen were the Cottage Lot and the Urban Home. Therefore, Opticos recognized that developers could not respond to the TND demand in areas where many of these special use developments would be appropriate (Opticos, 2013).

CHAPTER 4: SMALL LOT DEVELOPMENT OPTIONS

Austin's minimum lot standard for SF-3 zoning is 5,750 square feet. Austin's zoning ordinances increased the minimum lot standards every so often, from 3,000 square feet in 1931 to 3,500 in 1941, and settling on 5,750 square feet in the 1946 subdivision code. Aside from minimum lot standards, Austin has a long history of other restrictive land covenants that have influenced Austin's racial and income segregated city. Limiting the minimum lot size, house size, and limiting the number of units have historically served to prevent depreciating home values, maintain an area's appeal, and keep neighborhoods clean (Tretter, 2012). When cities require such large minimum lot standards, there is an associated drop in construction, because the amount of land is therefore fixed. Requiring more land per home results in fewer homes and higher prices (Glaeser, 2011). Although many other cities have minimum lot standards, Austin's standards are not comparable to other Texas cities or other cities similar to its size and growth patterns. Table 2 shows other cities' minimum lot standards by rank of largest sizes.

Comparable City	Minimum Lot Standard	Density (people per square mile) in 2010[2]
Austin, Texas	5,750 sq. ft.	2,653
Dallas, Texas	5,000 sq. ft. [3]	3,518
Nashville, Tennessee	3,750 sq. ft. [4]	1,265
Houston, Texas	3,500 sq. ft.[5]	3,502
San Antonio, Texas	3,000 sq. ft.[6]	2,880
Denver, Colorado	3,000 sq. ft. [7]	3,923

Table 2: Minimum Lot Standards. (Sources: see footnotes).

Current Austin zoning regulations restrict development or housing improvements to existing buildings that do not comply with the minimum square foot requirement, unless the lot qualifies as a Substandard Lot. A substandard lot is a lot with an area of 4,000 square feet minimum and a minimum of 33 feet wide, but it must also have been platted before March 15, 1946[8]. However, there also are many legally created small lots in older parts of Austin that still do not meet the substandard lot definition and are sitting vacant or have an existing structure that needs major renovations. For many decades, owners of such properties and buildings were not able to build or improve their land or structures. So in an effort to legitimize small lots, the Small Lot Amnesty (SLA) tool was created in 2004[9]. SLA allows for an area of 2,500 square feet minimum and a width of 25 feet minimum. Figure 1 shows an example of a development plat dated before 1946 with lot sizes of 25 feet by 100 feet. There are roughly 9,600 parcels in the city where SLA

[2] U.S Census. 2016 Community Quickfacts. Retrieved from http://www.census.gov/quickfacts/table/PST045215/4805000

[3] Dallas Development Code; Ch. 51, Art. IV, Div. 51-4.101- "Zoning Districts Established".

[4] Nashville Development Code; Title 17, Ch. 17.08, Section 010- "Zoning Districts Established".

[5] Houston Code of Ordinances; Ch. 42, Art. III, Div. 4, Sec. 42.181- "Single-Family Residential Lot size". Houston allows smaller lot sizes (as low as 1,400 sq. ft.) through special subdivision processes or by dedicating open space.

[6] San Antonio Unified Development Code; Art III, Div. 2, Sec. 35-310.05a. - "R-3" Single-Family Residential District; R-3 zoning is San Antonio's small lot zoning type. R-4 is its classic single-family residential zoning, with minimum lot sizes of 4,000 sq. ft.

[7] Denver Zoning Code; Article 5, Div. 2 Section 2 –"Specific Intent".

[8] City of Austin Land Development Code 25-2-943

[9] City of Austin Land Development Code 25-2-1406

applies (Lim, 2016). Opticos' report, the 'Land Development Code Diagnosis', recognized that the SLA could be a tool to facilitate the provision of such Missing Middle housing types (2014).

Figure 2: Arboles Estates Subdivision. (Austin History Center, 1936).

The 2007 amendment to the Substandard Lot Ordinance, which is different from the SLA ordinance, prohibits substandard lots from being disaggregated to form two or more new smaller lots. The ordinance describes disaggregation as, "A substandard lot that is aggregated with other property to form a site may not be disaggregated… to form a site that is smaller than the minimum lot area requirement" (Ordinance No. 20070726-131). This means that if a Substandard lot of 3,000 square feet was combined with another lot in the past, it could not be disaggregated to form a site less than 5,750 square feet. On the other hand, the 2004 SLA infill tool did not make disaggregation illegal until it was prohibited on February 11, 2016. For some time prior to February 11, 2016, there were cases in Austin of one single-family home that had been built across two or three 2,500 square foot lots, and was demolished to make way for two or three smaller homes under the SLA tool. See Figure 2 and 3 for a side-by-side comparison of a site in Austin that was developed into three SLA houses.

The initial recommendation to limit SLA was recommended by the Planning Commission's Codes and Ordinances Subcommittee on February 18, 2014 (City Council, 2016). Note, this was two years prior to the final City Council decision. Below are two excerpts from the October 19, 2015 Planning and Neighborhood Committee meeting, showing the two opposing arguments behind the SLA infill tool.

> There is a loophole in the code right now that small lot amnesty was intended to provide an opportunity … of substandard tracts to build structures, and what is happening on some of these lots is existing housing are being demolished and multiple houses being built and that is not the right course of things from an affordability perspective. I just learned today that a house is demolished on… East 4th; it was an older, probably an affordable structure, and now there are two proposed single-family structures…. I think it is very important that this loophole be closed.
> -- *Councilmember Tovo*

I think as we talk about affordability, with both size and density, that there is a value to the small lots and hopefully that this will be a part of that discussion instead of separate.
-- *Councilmember Gallo*

Figure 3: Before: A lot that qualifies for SLA. (Google Maps).

Figure 4: After: Three SLA Lots converted with SLA homes. (Whitworth, 2015).

AUSTIN CITY COUNCIL DECISION

The proposed code amendment that came before City Council on February 11, 2016 was to prevent using the SLA infill tool to disaggregate contiguous small lots, to create a smaller site that is less than the minimum lot area requirement (Planning and Zoning, 2015). In the background packet given to Council, Council staff noted they were not opposed to small lot infill, but rather felt the SLA tool is not the proper way to achieve such development (Planning and Zoning, 2015). Council staff stated in their closing decision that the cottage lot and urban home infill tool options are the best way to allow for small lot development. Table 1 describes the various Special Use Infill Tools, including the cottage lot and urban home tools. These tools provide for small lot development, as low as 2,500 square feet, but have various requirements, such as subdivision and city permitting. SLA disaggregation would not require the same subdividing and permitting requirements. It is assumed the Council staff prefers these tools because they were vetted and approved to create such density during the neighborhood planning process, which was discussed in Chapter 3.

Prior to the council meeting, the Council asked the Neighborhood Housing and Community Development Department to conduct an affordability analysis of the recommended changes to the SLA ordinance. The affordability impact statement given to Council noted the proposed changes were against meeting IACP affordability goals and its compact and connected goals. It noted the changes would create more regulatory barriers for developers to create affordable homes on lots for a lower cost (Neighborhood Housing and Community Development, 2015). Although the impact statement did not provide concrete evidence that the SLA homes could be considered affordable, the statement mentioned the SLA tool could improve affordability because land costs can be

distributed over multiple lots and structures, compared to new construction on a single, undivided lot. In an effort to suggest alternative language for the Council to consider, the report suggested the ordinance could add language such as "that at least one unit on the subdivided lot must be affordable to an ownership household at 80% MFI", or as a rental unit to households at 60% MFI (Neighborhood Housing and Community Development, 2015, pg. 2). This language change would significantly affect the developer, yet it was not discussed in full during the City Council meeting.

After conducting the public hearing, council voted 7-4 to approve amending City Code Title 25 to limit the redevelopment of existing small (or substandard) lots that are developed as a single building site. This means developers can no longer disaggregate more than one small lot that is considered one building site at the given moment. Much of the discussion, by councilmembers and citizens, surrounded the tool's misuse; it was being used in a way that was not the original intent. Various themes were formed during the Council's discussion. These themes were identified in the literature as well, and are as follows:

- Affordability
- Neighborhood intent and trust
- Displacement
- Infrastructure costs and tax revenues
- Regulations
- Costs
- Benefits
- A new stakeholder process

In an attempt to understand City Council's discussion and decision, this report conducted six interviews with various Austin stakeholders. Questions were drafted to gain a better sense of the timely discussion surrounding residential infill and small lot amnesty, from each interviewee's perspective and their professional or personal experience. The main theme was "are there any potential population growth benefits or costs to the Small Lot Amnesty tool?" Two city staff, one ex-planning commissioner, two developers, one neighborhood resident, and one Home-Builders Association meeting enlightened the study with their viewpoint and expertise. The interview location was chosen by the interviewees, or was conducted over the phone, but was never recorded on tape. The interviews lasted an hour and followed various discussion guide tailored to the interviewee's expertise. While not directly quoted throughout the report, some asked to remain anonymous.

Below are summaries of each theme, incorporating the City Council's discussion and the interview insight. While most stakeholders are represented in each topic, other unique and irregular topics are left uncovered for simplicity purposes. Some statements are not supported by the literature, whereas others are.

Theme 1: Affordability

The Council questioned the validity of the argument that disaggregation will encourage affordable housing, and even questioned how SLA supporters were defining affordability. One councilmember was adamantly against the overused statement that increasing the housing stock lowers housing prices overall, because Portland and Seattle have not been able to prove this statement either. Others interviewed shared similar sentiments, stating research has shown an increase in density over time does not equal a

decrease in cost of living. When homeowners or developers place secondary units and ADUs on the market, many believe owners will ask for the current market price, which will not increase the overall affordability in Austin. Many felt that any saved costs will not be passed onto the consumers. On the other hand, other councilmembers discussed that the lack of housing stock on the market was causing houses to sell for 5%-20% more than listing price, with numerous contracts on the table, because there simply are not enough houses on the market.

While grappling with the affordability question, there was a clear divide of how people chose to look at the infill tool. One side compared the cost of the new SLA structure to the cost of the existing house it would replace in the disaggregation process. Others argued this was not a fair argument, but rather that the correct comparison is to compare the new, smaller structure's cost to if the existing structure was replaced by one, larger housing structure.

It is important during this argument to remember that currently in Austin, the land is often more expensive than the existing structure itself, so paying for less dirt is more affordable than more. Many homes are built with a 50-year life span, so many single-family homes are in need of major rehabilitation. Sometimes renovations only makes sense if the homeowner chooses to increase their square footage, because their land costs are so high (personal interview).

Using the example of the small lot homes in North Loop, one speaker during the council meeting showed Multiple Listing Service (MLS) data. A newly constructed house in North Loop typically costs around $680,000, but a small lot home costs $440,000. It is important to note this example compared the SLA home to a new, larger structure, rather

than comparing it to the home it replaced. During the interviews, many discussed the reality that SLA homes are a higher cost per square foot during construction and at its sell price, but since the homes are smaller square feet, it remains less expensive overall. The higher cost per square foot can be attributed to economy of scales of buying construction material, and because city fees are spread across less square feet than a larger home. This quickly indicates that there are also other variables outside of land costs to consider when discussing affordability. On the household expenditure side, many highlighted that there are other costs savings for families in SLA homes, such as lower water utility bills, or not having to maintain older plumbing and maintenance bills.

Theme 2: Neighborhood Intent and Trust

While undergoing their Neighborhood Planning process, SLA had been marketed as a tool that small lots could use to develop or conduct substantial improvements on their substandard lots without going before the board of adjustment seeking a variance. Now that the SLA tool is being used in a manner to disaggregate lots, the Council felt if they allowed the tool to continue disaggregating lots, neighborhoods would lose their trust in the City Council.

Although some felt there is not an issue with infill or the resulting product, SLA is not the correct means to get to the result. However, others interviewed do not appreciate the end result, referencing either that the construction materials are cheap or the designs do not fit into the surrounding neighborhood context. Other interviewees were not against the higher density in their lower density neighborhoods, but many saw SLA as an aggressive way to increase density. These individuals called for gentle increases in

density, or rational density, that is context sensitive. Many asked the design standards be tightened so that the infill contributes to the neighborhood character.

Theme 3: Displacement

If disaggregation continues, the SLA tool will incentivize redevelopment, especially in older, centrally located neighborhoods in high demand. The Council members want development pressure fairly distributed across the city, not just in neighborhoods like East Austin, because they are concerned about the equitable repercussions. Also, many discussed that if more housing options do indeed increase affordability, the families being displaced in gentrified neighborhoods still cannot afford the new, smaller SLA homes. The surrounding land prices and high demand allow SLA developers to sell the small lot houses at a higher price.

Theme 4: Infrastructure Costs and Tax Revenues

Generally, residential infill is important to the city because a property is better used and contributes to taxes rather than standing vacant. Others interviewed disagree with the idea that residential infill increases the tax revenue to the City. Often times, public infrastructure ages and needs upgrading or expansion, like road improvements or sewage improvements, so current residents must fund such projects through bonds. Overtime, the bond's costs are passed on to existing residents and future residents, increasing the tax burden on the residents. Therefore, those interviewed believe even if there is more tax revenue from more housing units, the growth in population increases costs to the city and its residents more than the city intended.

The Civil Engineering consultant for IACP said infrastructure and services cost 15% less for compact growth patterns. Per capita costs for public infrastructure in dense

environments are lower compared to the per capita cost in greenfield, suburban development. Some of those interviewed view the migration of population into denser neighborhoods more as a necessity rather than a preference. The cost of infrastructure and maintenance is increasing, so denser communities are the only type of development society can afford.

An infrastructure concern that was discussed repeatedly in the council meetings and personal interviews was the concern of flooding, due to the increased allowance of impervious cover on small lots. The SLA, Urban Home, and Cottage Lot tools allow an increase of impervious cover up to 65%, whereas other single-family development cannot surpass 45% impervious cover. No concrete evidence was presented at the city council meeting to support or deny the potential flooding claims. Interviewees mentioned green infrastructure could solve potential flooding, like rainwater gardens and bioswales, but the added costs of these improvements would be passed on to the homeowners or renters.

An interviewee, who has been actively involved in their neighborhood, was able to retrieve water line capacity information from the Public Works Department. This information explains the current opportunities for, or lack of, increased utilization of the water line. This means the Public Works department can inform the City Council staff and the public about which areas of Austin can handle additional water run off, and where additional water run off would cause flooding. The interviewee explained the City should be directing additional small lot development and density near waterlines that have increased capacity.

Theme 5: Regulations

Many, including the councilmembers, expressed that the Urban Homes and Cottage Lots are alternate options for the SLA disaggregation technique, but it is important to note how many neighborhoods opted out of these tools during their Neighborhood Planning process. By closing the SLA "loophole", anyone who wants a small lot development type would need to choose between the Urban Home or Cottage Lot, which requires subdivision variances and fees. Many interviewed believe the Council questions why more Urban Homes and Cottage Lots are not being built, and those interviewed argue that these two tools are more difficult to build compared to SLA.

Subdividing lots requires a permitting process that can take up to six months to seek land use and building permits. This includes surveyors and water quality reviews. Other costly barriers to develop infill include water and wastewater taps. Most often, many are not aware of the amount of fees developers are required to pay, which sometimes deters the development from breaking ground. If fees amount to 40% of the total building costs, then the developer cannot provide housing at an affordable rate. The fees affect the final housing price.

Although infill is needed, the institutional undertakings of development are working against the effort to increase infill. For example, bankers, buyers, and the permitting process are easier for larger home construction rather than small lot infill. Financing is an issue for small lot homes, because banks typically want the structure of the house to be valued at 20-25% more than the land value or it will not appraise (private interview). Or another way of looking at the financial situation is that banks want a 70% ratio of Loan to Cost, or that the banks want the developer to already have 30% equity based on cost (private interview). As stated before, Austin's central neighborhood land is

very expensive. Therefore, in order to offset the high land value, many developers seek to build houses of higher square footage to increase the value of the structure.

Theme 6: Benefits

Stakeholders, both for and against the SLA argument, identified residential infill benefits. Many acknowledged residential infill aligns with IACP. One goal that would be reached by SLA is that residential infill will diversify the housing stock available for Austinites. This is important to IACP; due to demographic shifts and changing preferences, not every household desires large lot, single-family development.

In addition to the transportation, affordability, and housing goals, one individual pointed out that SLA can support the IACP goal of 'regional centers', if SLA was applied throughout Austin and it's suburbs. As stated in the IACP, regional centers will respond to Austin's desire for local businesses, town centers, bicycling and walking, and artistic character, but dispersing it outside of the downtown area. Therefore, the regional centers will also need residential infill options. However, another individual said residential infill is not appropriate in the periphery of a city; it is only appropriate in areas near central city, or in older, centrally located neighborhoods. This may be due to their view on the provision of amenities for higher densities, such as transit services, pedestrian and bicycling amenities, and proximity to stores and employment opportunities.

Infill has proven to lower vehicle miles traveled, even though neighbors will notice an increase in cars due to increased population density, which can lead to congestion. However, since residential infill also encourages and supports businesses and amenities, many households will choose to walk or bike to those destinations rather than drive. Many also identified it can increase bus ridership, thus increasing the demand for

transit, spurring increased bus frequency. This would only depend on the density added through SLA. However, some believe SLA and residential infill, in general, will only solve the IACP compact goal, yet not the connected goal. Ideally, in this compact and connected goal, destinations will be close to the housing, and transit will get us there. Austin's existing neighborhoods lack connectivity by roads or sidewalks, and the transit infrastructure is not powerful enough at the moment to fulfill connection. Lastly, Austin's land use does not exhibit destination proximity, so households must continue to travel longer distances to get to their destinations. Ideally, neighborhoods' connectivity would be improved before they can be considered compact and connected.

Theme 7: Costs

On the other hand, stakeholders, again on both sides of the SLA argument, identified residential infill costs. Classic costs identified were increased traffic, increased street parking, and the potential of teardowns. The city has found that many people grow accustomed to extra green space and view residential infill as taking that precious space away. Also, many expressed the added density from infill is more dense than what the neighborhoods imagined it would become.

Many believe residential infill is being conducted at the detriment of the neighborhoods and the character of the neighborhoods. As Austin is changing and growing, many features of Neighborhood Plans are being ignored, including design details such as the size, details and setback requirements. This is happening even in neighborhoods where their respective plan allowed infill. These individuals feel the City has pushed the IACP Compact and Connected goals more than others, such as the

environmental goals. Rather than the city focusing on Compact and Connected, neighborhoods feel the city is focused on density.

Theme 8: A New Stakeholder Process

Many who supported the code amendment suggested the SLA disaggregation technique should be revisited in a fair, open way through a new stakeholder process. The current code does not require developers to engage the community when making such infill changes; community engagement on a potential development project is only triggered when the Future Land Use Map will be changed. Many also felt these decisions, such as increasing density and affordability, should be made through CodeNEXT, rather than through this loophole. Whether through the CodeNEXT process or a separate process, many called for renewed public engagement, focusing on infill.

CHAPTER 5: ANALYSIS

The following analysis attempts to quantify many of the issues discussed during the City Council meetings and the personal interviews. The quantitative analysis in this chapter uses various techniques found in literature to estimate potential impacts by developing infill. The various techniques use publically accessible data and in some instances makes assumptions of the potential development patterns.

Two scenarios have been created to compare the hypothetical impacts of transforming an existing SF-3 block in Austin into a block of entirely SLA homes. While it may be unrealistic to assume an entire block would convert entirely into SLA houses within the next 50 years, it is proposed here as an extreme example in order to evaluate the many concerns vocalized during the interviews and City Council meetings. Scenario A is the existing block, as existing in 2013. Scenario B is the hypothetical SLA altered block.

For the analysis, the North Loop neighborhood was chosen because recent SLA homes in the neighborhood have received more attention compared to other SLA homes across Austin. It was also chosen because the neighborhood is served by nearby amenities, such as proximity to numerous bus lines and two public schools. It also has regional connectivity through the nearby Highway 290, Interstate 35, and the MetroRail, the only rail line in Austin. Therefore, the North Loop neighborhood is a good example to exemplify Image Austin Comprehensive Plan's Compact and Connected goals. See Illustration 1 for the location of the North Loop Neighborhood and various surrounding amenities.

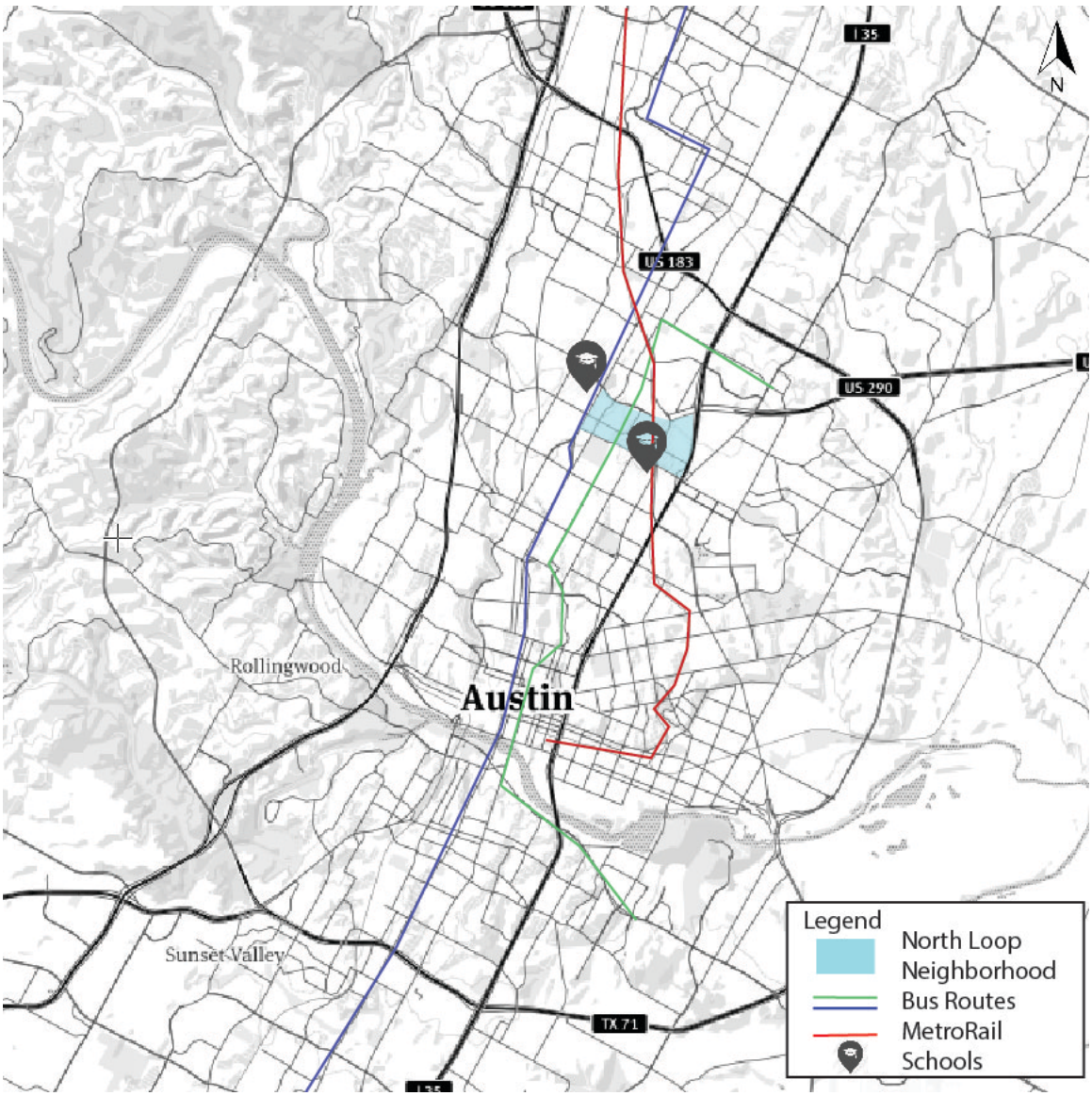

Illustration 1: Regional Study for the North Loop Neighborhood.

One block in the North Loop neighborhood was chosen for the Scenario analysis. The block qualifies for SLA housing, as the parcels' dimensions are 25 feet by various sizes, ranging from 121 feet to 132 feet in length, and was platted before 1946. The block is located at Avenue H, 53rd Street, Duval, and 52nd Street. It also has a notable alley way behind the homes that currently serves as a trash collector street, but was originally intended to be an access for each lot's driveway and/or garage. Illustration 2 shows

Scenario A's parcels and building footprints. Scenario A has 15 detached single-family homes, with 11 of the homes having detached back houses, storage sheds, or garages near the back of the property. It is worth noting that most of the housing structures straddle across two smaller parcels. In other neighborhoods, one single-family home may straddle across three smaller parcels. These smaller parcels qualify as the SLA lots. The red outlined parcels will be used for the impervious cover analysis, which will be later in this chapter.

Illustration 2: Selected block within the North Loop Neighborhood. (CoA, 2013 and 2015b).

The following two analysis topics, Population and Transportation, compared 2014 Census data in the North Loop Neighborhood to the Mueller Neighborhood. The Mueller Neighborhood's Census information was considered because it is a neighborhood that is currently introducing new, dense housing typologies in proximity to North Loop. The intent of this comparison was to examine whether or not similar household demographics were moving into the Mueller Neighborhood or not. One could assume denser developments, like the Mueller neighborhood or the SLA style of development, have unique demographic variables compared to the status quo.

Ratios from Scenario A were used to forecast future projections of demographic changes in Scenario B, assuming each parcel would redevelop into an SLA home. The North Loop block in Scenario B would therefore have 32 SLA homes, one new SLA home for each 2,500 square feet parcel.

POPULATION, HOUSEHOLDS, AND DENSITY

Persons Per Household					
	Census Block Base Data			**Estimates**	
	Existing			*Hypothetical North Loop Block*	
	North Loop	Mueller		Scenario A	Scenario B
Total Population	3338	3303	Number of Households	15	32
Number of Households	1546	1564	Total Block Population	32.39	67.58
Persons Per Household	2.16	2.11			

Table 3: Persons Per Household. (U.S. Census Bureau, 2014c and 2014d).

In order to forecast each scenario's total population, Scenario A's number of households was multiplied by North Loop's persons per household. Scenario B's number of households was multiplied by Mueller's persons per household, because the report is assuming a similar housing demographic will be attracted to SLA homes that are

attracted to Mueller dense neighborhoods. An increase of 17 more single-family homes would result in an increase of 35 additional people in Scenario B (See Table 3). This increase in density could add more children into the Austin Independent School District.

Children Per Household					
	Census Block Base Data			Estimates	
	Existing			*Hypothetical North Loop Block*	
	North Loop	Mueller		Scenario A	Scenario B
Total Children (5-9)	117	168	Number of Households	15	32
Number of Households	1546	1564	Total Children (5-9)	1.14	3.44
Children Per Household	0.08	0.11			

Table 4: Children Per Household. (U.S. Census Bureau, 2014b).

Using the same forecasting method as persons per household, Scenario A's number of households was multiplied by North Loop's children per household, and Scenario B's number of households was multiplied by Mueller's children per household. Approximately 2 children would be added to the Scenario B's block (See Table 4). Therefore, Scenario B's population increase could benefit the surrounding schools, which are experiencing a decrease in school enrollment. A recent study projects Ridgetop Elementary, the closest elementary school to the study site, a 25% decline over the next ten-year period (David, 2015). The school is currently under capacity, so added enrollment can benefit the school.

CARS, VEHICLE MILES TRAVELED (VMT), AND TRANSIT

Cars Per Household					
	Census Block Base Data			Estimates	
	Existing			*Hypothetical North Loop Block*	
	North Loop	Mueller		Scenario A	Scenario B
Total Cars Owned	1455	1471	Number of Households	15	32
Number of Households	1546	1564	Total Block Cars Owned	14.12	30.10
Cars Per Household	0.94	0.94			

Table 5: Cars Per Household. (U.S. Census Bureau, 2014e).

An increase in homes and population would also increase the number of cars on the given block. Using the same forecasting method as children per household, Scenario A's number of households was multiplied by North Loop's cars per household, and Scenario B's number of households was multiplied by Mueller's cars per household. Approximately 16 cars would be added to the block in Scenario B (See Table 5).

An increase in cars on a given block leads to the misperception that congestion will increase in the surrounding area. However, research has shown that with an increase in density, congestion, VMT, and car dependency may decrease (Zhang, 2009 and Ewing, 1994). Car dependency typically depends on demographic factors, such as income levels and the race of households, as Pollack et al. (2010) found in their research. Residents moving into neighborhoods that recently added a rail station were more likely to have a higher income and be less racially diverse than the residents already in place. Income is the primary determinant of car ownership, which is then the main determinant on whether or not the household will drive or take public transit (Pollack et al., 2010).

A study of American metropolitan regions found that as population density increases 1%, transit use and transit trips increased 19%. In the same study, a 1% population density increase resulted in a 34% increase for walking and biking trips

(Zhang, 2009). Zhang's study analyzed all trip purposes, including home, work, or shopping based trips. This means households in denser neighborhoods choose to walk, bike, or take transit to destinations rather than using their cars.

Getting households out of their cars and using other transportation modes will reduce the neighborhood's VMT. "As population density increases by 1%, VMT decreases by 5% to 16%" (Zhang, 2009, pg. 8). Reducing the overall VMT will decrease the potential congestion impact that many fear, but is contingent on the households reducing their automobile trips. To do so, the City should improve transit improvements and destination proximity. Bus frequency and infrastructure improvements can impact the household reliance on alternative forms of transit, and nearby jobs, schools, and retail locations can decrease the distances from households to destinations. At the city level, automobile trips will reduce from 4.4% with an increase of 1% in population density (Zhang, 2009). When the transit services and destination proximity are strong in a dense neighborhood, car ownership tends to fall (Ewing, 1994). Therefore, if density was increased Austin-wide, Scenario B could reduce the neighborhood's travel patterns.

AFFORDABILITY AND TAXES

Estimating affordability is very difficult because many variables impact the price of a home at the point of purchase. Therefore, many of those variables, like demand, competition, inflation, acquisition costs, tear down or relocation costs were not considered in the following analysis. Removing these factors, although important, leaves the bare market values of the land and of the structure, based on recent data in the Travis County Appraisal District (TCAD). Various housing structures in the North Loop neighborhood were considered, using real-world examples of homes that were recently

replaced by three new SLA homes, and real-world examples of homes that were recently replaced by one larger, single-family home. TCAD's appraised values, square footage, and city property taxes were considered to evaluate the affordability of the structures.

Households that pay more than 30% of income on rent are burdened households. A recent Harvard University study found that nearly 34% of American's homeowners are burdened, however for the purposes of this report, households are assumed to make rational decisions based on the 30% housing expense to income ratio (Joint Center for Housing Studies of Harvard University, 2015). In order to compare the following real-world examples' housing expenses to income ratios, mortgage amounts were estimated by assuming TCAD's appraised values were equal to the purchase price[10]. The mortgage was calculated using the PMT function in excel, which calculates the constant periodic payments to pay off a mortgage. The PMT function assumed a 30 year fixed mortgage, at an interest rate of 4.5%, with a 20% down payment. The resulting monthly mortgage payment then determined the income-level needed to afford such a house.

Tables 6, 7, 8 and 9 show each scenario's calculations. For the purpose of the following analysis, Scenario A now means the original house, before it was torn down. Scenario B is the new home, which is either one SLA home that disaggregated the lot, or the one, larger house that chose not to disaggregate the small lots. Table 6 and 7 are examples of one home being replaced by three SLA homes, and Table 8 and 9 are examples of one home being replaced by one larger home. At first glance, each example shows an overall increase in appraised value and monthly mortgage payments, which is

[10] Typically, a hedonic pricing method is used here, but due to availability of data, this report chose to use this mortgage method instead.

not a positive step toward affordability, because the new structures are less affordable than the house it replaced.

5204 Martin Drive: From 1 house to 3 SLA houses				
	Scenario A (2012)	Scenario B (2015)	Scenario B (adjusted 2012) PER HOUSE	Percent Increase
Appraised Value	$297,925.00	$398,374.00	$ 385,897.55	29.53%
TCAD "Living Area" sq. ft.	1,813.00		1,988.00	9.65%
Appraised Value Per "Living Area" sq.ft.	$ 164.33		$ 194.11	18.13%
Parcel sq. ft.	9,403.55		3,125.00	-66.77%
City Taxes	$ 1,498.26	$ 1,235.00	$ 1,196.32	
(City Taxes x 3 SLA homes)			$ 3,588.96	139.54%
Mortgage Calculations				
Home Value	$298,000.00		$ 386,000.00	
20% Down Payment	$ 59,600.00		$ 77,200.00	
Loan Amount	$238,400.00		$ 308,800.00	
Monthly Payments	$ 1,207.94		$ 1,564.64	29.53%
Annual Payments	$ 14,495.28		$ 18,775.68	
Income Level	$ 48,317.60		$ 62,585.60	29.53%

Table 6: Example 1: Affordability Calculations. (TCAD, 2016).

5106 Caswell: From 1 house to 3 SLA houses				
	Scenario A (2012)	Scenario B (2015)	Scenario B (adjusted 2012) PER HOUSE	Percent Increase
Appraised Value	$272,083.00	$369,464.00	$ 357,892.97	31.54%
TCAD "Living Area" sq. ft.	1,455.00		1,988.00	9.28%
Appraised Value Per "Living Area" sq.ft.	$ 187.00		$ 225.09	20.37%
Parcel sq. ft.	8,950.80		3,125.00	-65.09%
City Taxes	$ 1,368.31	$ 1,593.74	$ 1,543.83	
(City Taxes x 3 SLA homes)			$ 4,631.49	238.48%
Mortgage Calculations				
Home Value	$272,000.00		$ 357,000.00	
20% Down Payment	$ 54,400.00		$ 71,400.00	
Loan Amount	$217,600.00		$ 285,600.00	
Monthly Payments	$ 1,102.55		$ 1,447.09	31.25%
Annual Payments	$ 13,230.60		$ 17,365.08	
Income Level	$ 44,102.00		$ 57,883.60	31.25%

Table 7: Example 2: Affordability Calculations. (TCAD, 2016).

5402 Avenue F: From 1 house to 1 house				
	Scenario A (2012)	Scenario B (2015)	Scenario B (adjusted 2012)	Percent Increase
Appraised Value	$242,998.00	$519,806.00	$ 504,124.17	107.46%
TCAD "Living Area" sq. ft.	782.00		2,577.00	229.54%
Appraised Value Per "Living Area" sq.ft.	$ 310.74		$ 195.62	-37.05%
Parcel sq. ft.	6,240.29		6,240.29	0.00%
City Taxes	$ 1,222.04	$ 2,499.74	$ 2,424.33	98.38%
Mortgage Calculations				
Home Value	$243,000.00		$ 504,000.00	
20% Down Payment	$ 48,600.00		$ 100,800.00	
Loan Amount	$194,400.00		$ 403,200.00	
Monthly Payments	$ 984.99		$ 2,042.90	107.40%
Annual Payments	$ 11,819.88		$ 24,514.80	
Income Level	$ 39,399.60		$ 81,716.00	107.40%

Table 8: Example 3: Affordability Calculations. (TCAD, 2016).

5511 Avenue F: From 1 house to 1 house				
	Scenario A (2012)	Scenario B (2015)	Scenario B (adjusted 2012)	Percent Increase
Appraised Value	$215,607.00	$484,731.00	$ 476,427.76	120.97%
TCAD "Living Area" sq. ft.	808.00		2,471.00	205.82%
Appraised Value Per "Living Area" sq.ft.	$ 266.84		$ 192.81	-27.74%
Parcel sq. ft.	6,125.86		6,125.86	0.00%
City Taxes	$ 1,083.86	$ 2,224.43	$ 2,186.33	101.72%
Mortgage Calculations				
Home Value	$216,000.00		$ 476,000.00	
20% Down Payment	$ 43,200.00		$ 95,200.00	
Loan Amount	$172,800.00		$ 380,800.00	
Monthly Payments	$ 875.55		$ 1,929.46	120.37%
Annual Payments	$ 10,506.60		$ 23,153.52	
Income Level	$ 35,022.00		$ 77,178.40	120.37%

Table 9: Example 4: Affordability Calculations. (TCAD, 2016).

However, when comparing the new structures only, i.e. not considering the homes they replaced, the SLA homes are more affordable than the larger structures. The SLA homes are more expensive per square foot, but since there are fewer square feet, the

homes are less expensive overall. The increase in monthly payments is significantly less when comparing SLA homes to the larger homes. For example, an SLA home increased monthly payments by 30%, whereas a large home increased monthly payments by 107%.

The income level needed to purchase the SLA home was lower than the larger house; however, both scenarios did increase the income level needed compared to the original home. This is the root of the SLA debate, is the SLA home being compared to the house it replaced or the house it could have become. The 2014 median household income in Austin was $55,216 (U.S. Census Bureau, 2014a). Table 10 shows the percentages of income levels in various income brackets. With this information, this report attempts to estimate the percentage of Austin residents that could afford the mortgages identified in Tables 6-9. 68.5% of Austin could afford the original home's mortgages, 54.4% of Austin could afford the SLA mortgages, where as only 24.9% of Austin could afford the large home developments.

Median Household Income

Total households	344,289
Less than $10,000	7.80%
$10,000 to $14,999	4.50%
$15,000 to $24,999	9.50%
$25,000 to $34,999	9.80%
$35,000 to $49,999	14.10%
$50,000 to $74,999	17.60%
$75,000 to $99,999	11.90%
$100,000 to $149,999	13.20%
$150,000 to $199,999	5.40%
$200,000 or more	6.30%

Table 10: Median Household Income. (U.S. Census Bureau, 2014a).

IMPERVIOUS COVER

Scenario B will have a direct impact on the amount of impervious cover in the neighborhood compared to Scenario A. The SLA ordinance allows up to 65% of impervious cover, where as the SF-3 requirements in Scenario A restrict the impervious cover to only 45%. Impervious surfaces can have a negative impact on Austin's water management, because instead of rainwater soaking in and filtering through the soil, rainwater runs off the impervious surfaces and relies on storm water systems to move the water out of the neighborhood. The volume of the water runoff is therefore increased, resulting in higher peak flows, which can impact pooling, or even flooding (Envision Tomorrow, 2012). This is of concern to many involved in the SLA debate; as the weather has become more extreme, Austin has experienced an increase in flooding.

Assuming the SLA home builder would chose to build up to 65%, allowable by ordinance, an estimate of Scenario B's pervious cover can be compared to the existing, Scenario A, pervious cover. City of Austin data was used to compute the chosen block's pervious cover, which equals the block's area minus the building footprint. An additional 5% of the lot was considered impervious, to account for driveway and sidewalk paving that is not accounted for in the building footprint. Scenario A has 74,255 square feet in pervious cover.

Scenario B assumed 60% of the SLA parcel would be the building footprint, and the additional allowable 5% would be driveway and sidewalk paving. Therefore, the hypothetical Scenario B would have 37,765 square feet in pervious cover. This is a reduction of almost 50% in pervious cover. With this variance in pervious cover, the storm water runoff can be calculated to show the potential impact of flooding in the Austin region.

Pervious Cover		
	Scenario A	Scenario B
Land Base Area (sq. ft.)	102,070.04	102,070.04
Building Area (sq. ft.)	26,490.50	61,242.02
Paved Surface Assumption (+5% Impervious Cover)	1,324.52	3,062.10
Pervious Cover (sq. ft.)	74,255.02	37,765.91

Table 11: Pervious Cover. (CoA, 2013 and 2015b).

The following analysis uses the *PDHOnline Course's* guide to estimate storm water runoff through a weighted average formula (Poullain, 2012). Rainfall frequency during a design storm is needed. A "design storm" is a theoretical storm event based on rainfall intensities associated with frequency of occurrence and a set duration of time (National Oceanic and Atmospheric Administration, 1973). For example, a 2 year- 1 hour storm event is one that theoretically occurs once every 2 years, and lasts for an hour. A 2 year- 1 hour design storm in Austin has an average of 2 inches of rainfall, and has a 50% probability of happening any given year. This design storm was chosen to reflect a storm that will likely happen.

Instead of calculating the runoff for the entire block, parcel number 20 and 19 were chosen as an example that can be applied across other SLA locations in Austin. Illustration 2 shows the parcels chosen, outlined in red. Scenario A has two parcels with one single-family building and one backhouse-type structure. Scenario B has two SLA houses on its own parcel, assuming 60% building capacity and 5% driveway and sidewalk capacity. Table 12 shows the differences in runoff calculated by the rational formula, with the weighted averages of runoff coefficients. Scenario B has an increase of 173.98 cubic feet of water runoff in this 2 year- 1 hour storm event. This amount of water

runoff can negatively impact a neighborhood if the neighborhood's storm water system is currently at capacity.

Storm Water Runoff: 2 year, 1 hour design storm						
	Scenario A			Scenario B		
Ground Cover	Area (acres)	Runoff Coefficient	Area x Coefficient	Area (acres)	Runoff Coefficient	Area x Coefficient
Rooftop	0.037	0.95	0.035	0.091	0.95	0.086
Lawns	0.102	0.5	0.051	0.049	0.5	0.024
Total Ground Cover	0.139		0.086	0.139		0.110
Weighted ave coefficient	0.619			0.793		
Runoff Rate	0.173			0.221		
Water Runoff (cubic ft)	**621.16**			**795.15**		

Table 12: Storm Water Runoff. (National Oceanic and Atmospheric Administration, 1973; Poullain, 2012).

Through various interviews, many indicated the City's Public Works Department, or similar departments, should calculate current load and potential capacity in the neighborhood's storm water system. If the potential capacity indicates room for growth, many believe then the City can direct density and infill into such neighborhoods. Jeff Jack, a Zilker neighborhood resident, shared the following study as an example that can be done to estimate potential water capacity and density capacity.

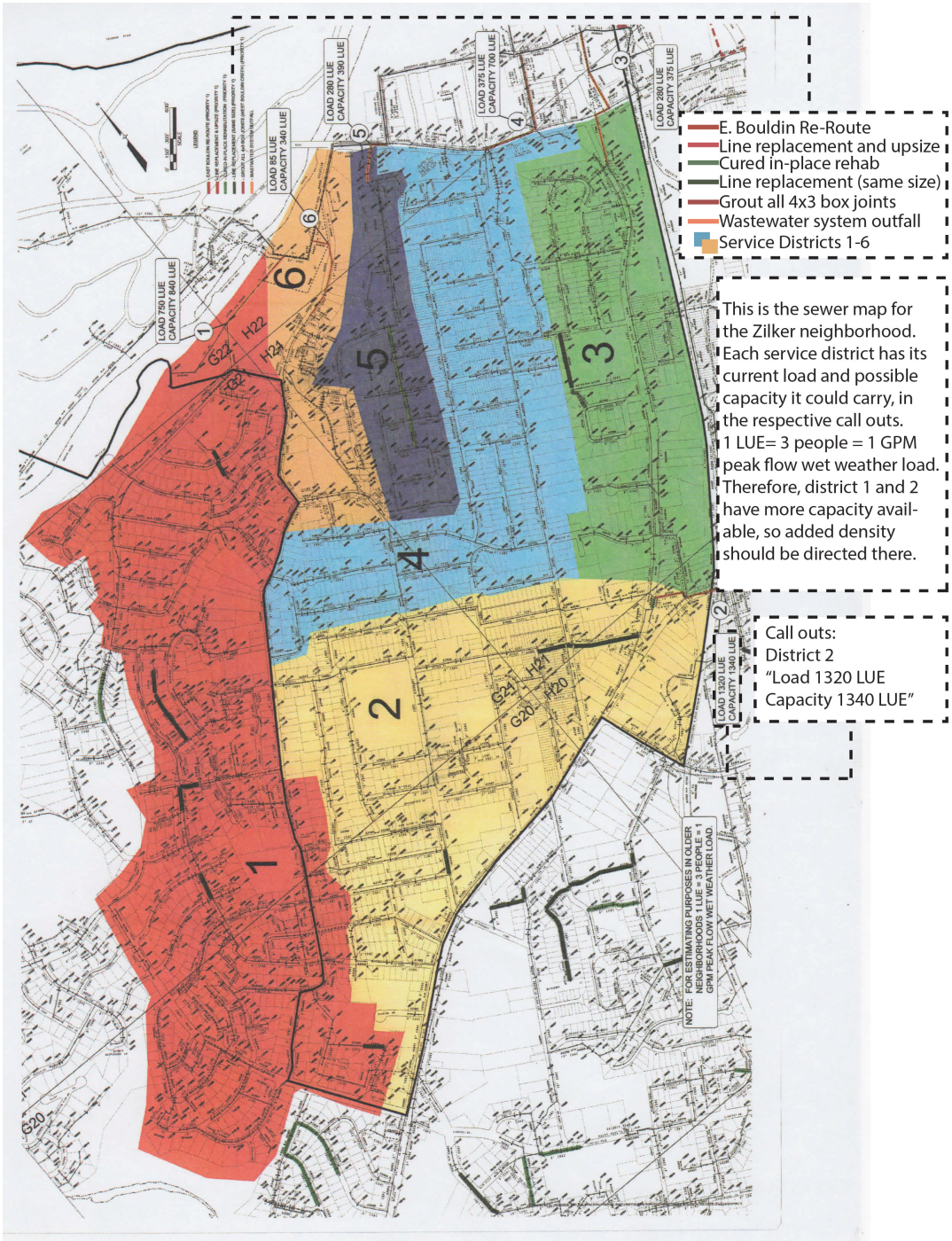

Figure 5: Storm Water System Capacity. (Personal interview).

CHAPTER 6: CONCLUSIONS

RESULTS

The results of the analysis show how complex this issue really can become. The analysis did not attempt to prove the City Council's decision wrong or right, but rather attempts to address many of the concerns and arguments that were for or against SLA. The results and literature suggest there are many benefits to creating infill and density, but with the stipulation that the city invests in existing infrastructure to carry an increased population load. Improvements should entail transit improvements, pedestrian infrastructure, and water and storm water infrastructure. SLA homes aside, the city would need to make similar improvements no matter what type of development pattern, especially if increasing the density in older, centrally located neighborhoods.

Some of the analysis that was originally planned for was not completed, due to various levels of challenges. Some information was not available, like the current ridership of certain bus routes that travel through the North Loop neighborhood, or the modal split or VMT of the Austin citizens at the neighborhood level. If this information was available, the report could have analyzed the SLA impact on such variables, through the ratios from Zhang's research (2009).

Many hesitate to believe the tall tale that building more housing and adding density increases the affordability for the current residents; especially since many other similarly situated cities, like Seattle, have not been able to draw a direct correlation between added housing and affordability. One disclaimer that became apparent through this research is that cities cannot analyze affordability changes over a short period of

time, but rather need to look at longer time span. Over time, new housing filters down as more affordable supply as the housing becomes less desirable with age. Today's middle-class housing was luxury housing 30 years ago (Jacobus, 2016; Badger, 2016; Glaeser, 2011). The affordability analysis above realized the SLA homes are less affordable than the homes they replaced. SLA prices today may not reach the affordability goals Austin seeks, but would reach such goals over numerous years.

The previous analysis scale, at the neighborhood level, is one way to look at Austin's affordability. Another scale to be considered is regional affordability improvements versus neighborhood affordability. New development may lower prices regionally, even when it raises prices in a specific neighborhood. Glaeser (2011) and Jacobus (2016) argues that building luxury housing will even bring down regional rent and housing prices, because the additional units add more room for the middle class once the wealthy vacate their older homes. For example, when analyzing the impact of new development on gentrification or displacement, the California legislative analyst's office found that the neighborhoods which received more construction had less displacement than similar neighborhoods that were more restrictive towards new construction (excluding neighborhoods that had inclusionary zoning) (Badger, 2016). California's conclusion goes against arguments that new housing displaces current residents. Glaeser (2011) also offers this comparison to cities like Chicago and Houston, which are both construction friendly; they both keep housing prices relatively low because they do not restrict construction as much as similarly situated cities. Jacobus (2016) provides an explanation of how this could be; he states it depends on what kind of housing is being developed in the existing neighborhood.

If the housing typology or character is drastically different than the existing housing, the perception of the neighborhood is immediately changed. And just overnight, the market responds to the new perception, and a new housing demand market is in place. This type of speculation can affect the housing demand in one neighborhood with SLA potential, which can displace households, but overall could improve the region's affordability. However, this report's scale only considered the scale of one neighborhood and not the region, and also did not consider speculation or overnight perception changes.

Much was not analyzed, either for lack of data or due to the scope and purpose of this report. Through the process, however, many questions remain unanswered, which leads to potential future research. These research possibilities will complete the impact analysis of small lot development.

FACTORS FOR FURTHER STUDY

The City has already engaged with developers and the Home Builders Association surrounding the high costs of developing in the City of Austin (private interview). Future research can analyze the full impact of costs outside of fees and permits, such as the high cost of residential land costs and how lending institutions may or may not influence the housing typologies developers can build. Although the City cannot influence these two factors, having a strong understanding of why development has become the way it is will help staff and City Council make sound, supported decisions for future development opportunities.

If the City has not already done so, the city can undergo an extensive infrastructure capacity review. The City can find particular areas that are best suited for added density, like SLA, because these areas are least prone to generate excess runoff,

are best served by transit, or are nearest to neighborhood services. The current capacity of the water systems can be telling where and when higher densities should be located. If a system will eventually need updating because it has reached capacities, the City needs to forecast costs for updating existing infrastructure, potentially through issuing bond packages. Then further research can analyze how bonds have or have not increased tax burdens on existing residents, and how much future bonds will impact taxes.

Another opportunity for research is to track residential building permits and decipher if there are similarities or differences between housing typologies influencing teardowns. For example, many citizens are concerned the SLA tool will encourage teardowns, which can create waste, threaten historic houses, and encourage speculation. It may be found that SLA encourages teardowns, but also all other housing types may encourage teardowns.

During the personal interviews, developers explained how the financing and institutional framework encourages homebuilders to build larger houses in Austin. One of the factors attributing to this was the high cost of land. Additional research could be conducted on these issues, and how they affect the housing affordability issues in Austin. Are homebuilders really guided to increase the home's footprint? Other cities with high cost of land can be used as a case study.

Many view the SLA tool as giving additional entitlements and thus tremendous value to the SLA developers, without the city receiving anything in return. A future research opportunity could identify avenues to capture this additional value. In transportation planning, there is a financing mechanism called value capture. Transportation theory suggests that accessibility to transit will increase the surrounding

property values. Mechanisms include capturing incremental property tax increases or enacting a transit impact fee. The revenues accrued are typically directed to either offset maintenance costs, enhance the transit authority's revenue yield, and improve the authority's stability (Mathur, 2013).

A value capture system could be tailored for the purpose of Austin's affordable housing. First, there would need to be a mechanism to evaluating the additional entitlement value given to developers who choose to disaggregate lots. A portion of the additional entitlement could then be recaptured and directed toward affordable housing subsidies. However, this may add to the list of costs, like fees and permits, many developers have been experiencing that continue to raise Austin home prices. If the City decides SLA homes are not providing the level of affordability they would like to see, then value capture could provide additional funding for future projects.

FINAL THOUGHTS

The City of Austin had good intentions when creating the SLA tool back in 2004, and also had good intentions when limiting the tool in February 2016. Although it caused much ache and investigation, the SLA tool allowed Austin to imagine what small lot development would look like in the area. Moving forward, CodeNEXT will most likely introduce a housing typology variety that can address Austin's housing needs. The City and City Council will need to assist Opticos to educate and mitigate residents, homebuilders, and staff on any potential changes. This may involve a lengthy and costly civic engagement process, but as the Council experienced with the debates surrounding SLA, there needs to be an open, direct process that is fair and informational.

Austin City staff and City Council can model their participation strategies on a very similar set of discussion issues in Portland, Oregon. Portland is comparable to Austin and its growing pains, and the city recently started a participatory process to gain public input surrounding their housing issues (City of Portland, 2015). Three primary topics were addressed to influence the rewrite of the City's zoning code regulations for residential development in single-family zones: scale of houses, narrow lot development, and alternative housing options.

Their public outreach strategies had multiple forms, including public forums, an online survey, charrettes, open houses, and a Stakeholder Advisory Committee (SAC). The online survey tool place over 5 weeks and collected over 7,000 responses. The SAC consisted of residential representatives, as well as representatives from building and real estate community. The SAC had six training meetings, where they learned about development code and went on walking tours of various neighborhoods. This project is ongoing, but the strategy includes transparency and ongoing involvement. For example, the SAC meetings are open to the public, and updates are frequently published on an easy-to-navigate website. The final goal is to have the City Staff develop code options, which will be vetted through a public hearing process.

If the City of Austin chose to implement such a participatory process, many residents may feel overwhelmed with the evolving CodeNEXT process, how this process would feed into it, and how their neighborhood plans would be upheld with any changes. As Council pointed out so well, the Council did not feel comfortable viewing Small Lot Amnesty on its own, but rather that it needed to be included in the overall housing option

discussion for the entire community. CodeNEXT, with an additional housing component, could address these concerns.

One suggestion that may not be addressed within CodeNEXT's code rewrite is that the city and its constituents should consider reducing the minimum lot sizes allowed within residential areas. As shown in Table 2, Austin has the largest minimum lot standard for their main single-family zoning standard compared to its comparable cities. Even a reduction to 4,000 square feet can create a more efficient use of land.

Ultimately, Austin will need to be creative and progressive if the city wants to truly improve their affordability. The momentum behind these issues is well developed, but the city's leaders must transform the ongoing debates into consensus building opportunities. The best compromises will come from a community in agreement, rather than one divided.

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